

WICHITA STATE UNIVERSITY

Extended LAN Services and Aviation Data Networks

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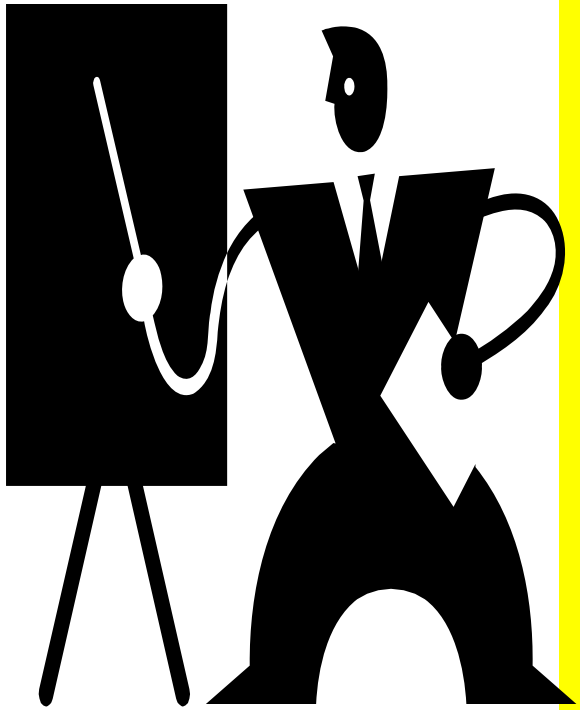
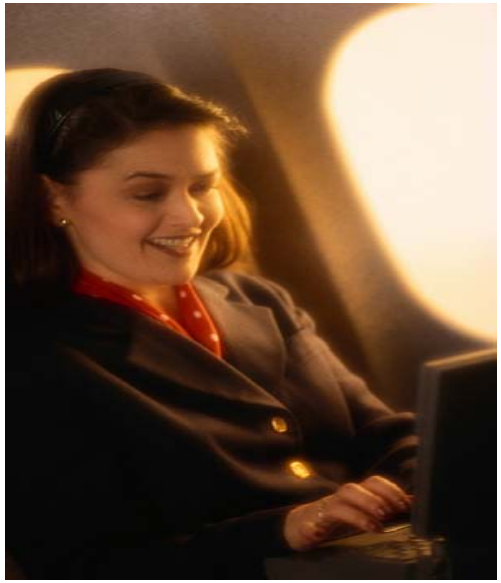
Outline

- Introduction
- ADN and advanced services
- LAN extension
  - Advantages
- LAN extension and ADN
  - Options
  - Challenges
- Future directions



Introduction

- Internet connectivity within the airplane is a reality
- Standards are still evolving
- Opportunities



ADN and Advanced Services

- Data Services
  - Internet connectivity
  - Real-time download of aircraft data to the ground station
  - LAN extension
- Multi-media services
  - Voice over IP
  - Video over IP
- Entertainment

ADN and Advanced Services (contd…)

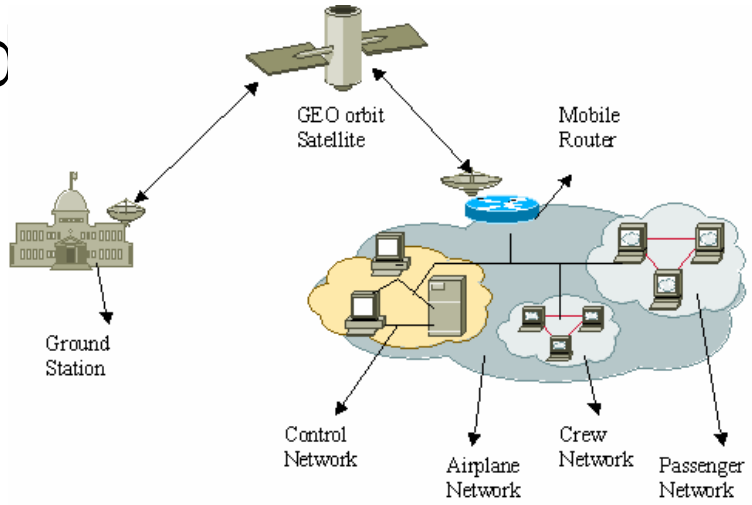
- Challenges
  - Data transfer mechanism
    - File transfer mechanisms
      - FTP, sFTP
    - File I/O mechanism
      - NFS
    - Block I/O mechanisms
      - SCSI, iSCSI
- Possible solution
  - Shared volume (File I/O)

LAN Extension

- Allows extending a LAN segment beyond a specific geographic location
  - Extend the broadcast domain
  - Limit the collision domain to the geographic location
  - Advantages
    - Address space
    - Network resource sharing
    - Ease of management

LAN Extension and ADN

- Extended LAN allows easier data sharing between the aircraft and ground station
  - Mirroring of control network traffic
  - Downloading video data
  - Sharing of network resources
    - Custom applications
    - VoIP devices



LAN Extension and ADN (contd…)

- Options
  - VPNs
    - IPSec, Layer 2 VPNs
  - VPLS
    - Works based on MPLS
    - Needs protocols like BGP run on edge devices
  - Layer 2 tunnels
- Challenges
  - Overhead
  - Resource constraints

Conclusions

- Internet connectivity can be used to download data from aircraft to the ground station
- Traditional data transfer mechanisms do not work well
- LAN extension is one of the options
  - Layer 2 tunnel based LAN extension is better for ADN

Future Directions

- Implement off-the-shelf LAN extension protocols in an ADN environment and evaluate the performance
- Develop a protocol to dynamically exchange LAN information with the ground station
- Develop a mechanism to share data between multiple aircrafts in the air

QUESTIONS ?

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